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Wildlife Resource Report

Little Deer Project

Goosenest Ranger District, Klamath National Forest
Siskiyou County, California

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Executive Summary

The focus of this section is to depict the existing wildlife habitat conditions of the project, analysis and treatment areas that may be affected by the project proposed activities and the resulting direct, indirect, and cumulative effects to wildlife species and habitat in these areas. Wildlife species to be addressed are federally-listed, Forest Service Sensitive, Management Indicator, Survey and Manage, and migratory bird species.

Methodology

Methods for analysis focused primarily on assessment of wildlife habitats, habitat distribution, and potential disturbance created by the proposed activities. Assessments were made by reviewing habitat for each species in the field, performing species surveys, reviewing relevant scientific research and literature, and using GIS analysis. Field reviews of habitat in the project area were conducted in 2014 soon after the Little Deer fire.

Analysis Indicators

For all terrestrial wildlife species and their habitats, this section considers the direct and indirect effects of the alternatives to individuals, if known, or to potential habitat quantified by acres. Indicators include the acres of suitable habitat potentially affected by the alternatives, disturbance (e.g. noise), and relative rate of habitat regeneration.

Spatial and Temporal Context

The ***Treatment Area*** boundaries reflect the physical project footprint on National Forest System land, where proposed treatments will occur. ***The Project Area*** is the National Forest System land within the Little Deer fire perimeter. The ***Analysis Area*** varies by species and reflects the area within which the species can be directly and indirectly affected by the proposed action and alternatives. For most species, the Little Deer Fire burn perimeter, or project area plus one-half mile, is used for the analysis area.

Short-term temporary bounding is during or within five years of implementation of activities. Long-term temporal bounding for effects extends out to 30 years following inventory conditions (2014). Treatments are projected in the years 2015 and 2016 with post-treatment analysis ending in the year 2044. Since stand development is modeled for a 20-year period, this is adequate time in which to display the differences in wildlife habitat between treating and not treating stands in the project area.

Affected Environment

The affected environment differs based on the scale at which it is being described. Within the treatment areas, especially those proposed for dead tree removal, there is currently little to no suitable habitat for species associated with late-successional habitat. This is because of the high intensity and severity of burn in the Little Deer fire and the limited amount of such habitat in the area before the fire began as described in the Wildlife resource report. Components of habitat such as snags and coarse woody debris exist in the units proposed for dead tree removal but other components such as canopy closure are lacking. Therefore, the dead tree removal units currently do not contain habitat for species associated with late-successional habitat.

The Forest Service sensitive wildlife species known to be present in or adjacent to the treatment, project and analysis areas, or those for which suitable habitat is present, are displayed in Table 1. The federally-listed northern spotted owl, vernal pool fairy shrimp, yellow-billed cuckoo, or gray wolf, or species proposed for listing (Pacific fisher), are not included in the detailed analysis since there is no habitat for them (see Wildlife resource report).

Table S- 1: Forest Service sensitive species in or adjacent to the project area, based on known occurrences or presence of suitable habitat

Species	Status	Known to Occur in Analysis Area?	General Habitat Description
Bald eagle	Forest Service Sensitive	No known nest or roost sites in the project area.	Nests in conifer forests containing old-growth components typically within1 mile of water
Northern goshawk	Forest Service Sensitive	No known active nest sites or designated goshawk management areas.	Nests in dense, mid-mature and late successional conifer forests
Greater sandhill crane	Forest Service Sensitive	No known locations; there is habitat potential in the analysis area but outside the project area.	Wet Meadows
Pallid Bat	Forest Service Sensitive	No known locations, but occurrence is possible based on available snag habitat; large rocky outcrops, caves or mines are not known within or adjacent to project area.	Uses a variety of arid and or wooded habitats often in association with caves for roosting; will use caves, large trees, mines, buildings and bridges for roosting
Townsend's big-eared bat	Forest Service Sensitive	No known locations, but occurrence is possible based on available snag habitat; caves or mines are not known within or adjacent to project area.	Variety of wooded habitat often in association with caves for roosting; will use caves, large trees, mines, buildings and bridges for roosting
Fringed Myotis	Forest Service Sensitive	No known locations, but occurrence is possible based on available snag habitat; large rocky outcrops, caves or mines are not known within or adjacent to project area.	Uses a variety of arid and or wooded habitats often in association with caves for roosting; will use caves, large trees, mines, buildings and bridges for roosting
Western Bumblebee	Forest Service Sensitive	No known locations. Low potential for suitable habitat.	Open meadow and aspen habitats

A summary of the information available on Survey and Manage species is provided in the Wildlife resource report. The project area does not contain suitable habitat for any Survey and Management species as addressed in the Wildlife resource report.

Wildlife Management Indicator Species for this analysis include those representing the snag species association as detailed in the Management Indicator Species report (Parts I and II). These species include the red-breasted sapsucker; hairy, white-headed, downy, pileated and black-backed woodpeckers; and Vaux' swift. Snags are abundant in the treatment and project area as discussed in the Management Indicator Species report. In addition to the project-level management indicator species, several Forest emphasis species occur in the project area; these include deer and elk as discussed in the Wildlife resource report. For the Forest, migratory birds of management concern are federally-listed, Forest Service Sensitive, and Management Indicator species; effects to these are analyzed as part of the analysis of these species listed above. All of the documents referenced in this section are available on the project website.

Environmental Consequences

Alternative 1

Direct Effects and Indirect Effects

No project activities will occur in this alternative. Recovery of previous wildlife habitat will take several decades of time; wildlife habitat will be primarily grass, shrubs and snags in the short term. The long-term result is not likely to be forested stands that provide habitat for late-successional dependent species but instead be slow recovery of pine forests that existed in the area before the fire.

This alternative will result in no treatments and, therefore, no direct effects to individual wildlife or wildlife habitats are anticipated. The indirect effects expected will be those related to slow re-growth of forested habitats. Overall, effects to wildlife and wildlife habitats will result in reduced availability and distribution of stands that can develop into suitable habitat. Short-term effects to snag-associated species, particularly the black backed woodpecker, will be positive for about the first five years until most of the snags decay and fall (see the Vegetation section of this document and the Vegetation resource report) or food availability will decrease (see Wildlife resource report).

Cumulative Effects

The effects of past action and events, including those listed in appendix C, to wildlife and habitat are included in the description of the affected environment. Adding the effects of alternative 1 to the effects of ongoing and reasonable foreseeable future actions will produce no substantial cumulative effects to wildlife or habitat.

Alternative 2

Direct Effects and Indirect Effects

The effects to wildlife and habitat of this alternative include the implementation of project design features (table 2-1 of chapter 2) to minimize negative effects. Among other requirements, project design features designate the number of snags to be left standing in order to meet forest-wide Forest Plan standards. Snags are left in groups to provide structure and cover. Snags left in each unit will vary by unit size, shape, and land allocation. Snags from the largest size class will be chosen in each stand to make up the clumps for wildlife; however, not all of the largest trees in each unit will be retained because of safety concerns or implementation challenges. It is anticipated that the majority of the trees within dead tree removal units will be harvested since most burned at a high level of intensity with high severity effects.

Proposed dead tree removal in alternative 2 will not affect bald eagle habitat because these areas burned at high intensity and do not retain all of the components for suitable habitat, but the PDFs will retain large snags that are important for future eagle habitat or perch site. The project area didn’t contain goshawk nesting habitat before the fire and it isn’t likely to develop into goshawk habitat for several decades. Small areas of possible western bumblebee habitat will not be affected by the proposed activities. For snag associated management indicator species, there will be some degradation of snag habitat in these areas but the treatments will retain leave areas and

individual snags at levels that meet or exceed Forest-wide standard snag levels. The proposed hazard tree removal treatments will degrade about 200 acres of snag habitat along system roads; however, the low number of trees treated per mile and the small number of acres of treatment will still allow for physical structure and perches for eagles and other bird species to move through the area. This hazard tree removal will maintain habitat conditions after treatment.

Snag habitat will be degraded with the proposed dead tree removal treatments; however, habitat will remain capable of providing habitat for snag associated species after dead tree removal. With the implementation of snag-related project design features, and the relatively small proportion of the project area being treated, alternative 2 will not limit the availability of large snag distribution for the possible pallid bat, fringed myotis, or Townsend's big-eared bat in the analysis area. Disturbance from both dead tree removal and hazard tree removal activities may temporarily affect roosting for these species.

Management indicator species associations are used to assess trends in specific habitat components important to many wildlife species. Each of the associations is made up of a set of species that require similar habitat components (e.g. snags) that may slightly vary (e.g. in snag size class or decay class). The Forest Plan EIS provides an assessment for retaining a particular minimum number and size of snags to meet the needs of snag associated species and minimize impacts. The assessment resulted in the development of Forest Plan standards (8-21 to 8-25, page 4-30). These standards require providing an average of five snags per acre, in a variety of size and decay classes, within the landscape; these snags need not be equally distributed. Implementation of wildlife project design features (table 2-1 in chapter 2) assures compliance with these standards to minimize potential impacts to snag-associated management indicator species.

Snag-associated species are closely tied to snags to meet their needs and the proposed dead tree removal activities will remove a portion of the snags in these units. However, it is not the intent of this analysis to determine the effects of the proposed activities on a particular Management Indicator species; rather it is our intent to analyze the potential effects to the species' habitat.

Alternative 2 will remove about 1,798 acres of snag-associated species habitat created by the Little Deer fire. Removal of snags in the dead tree removal units will not drop the number of snags below the Forest Plan standards because snags of varying size and decay will be retained within the treatment units. In addition, the placement of these retained snag areas reduces the distance between groups or individual snags and will provide snags for use by snag-associated species after treatment in the dead tree removal units. The Management Indicator Species report (parts I and II) provides more specific information on effects of this alternative to the species.

Cumulative Effects

The effects of past action and events, including those listed in appendix C, to wildlife and habitat are included in the description of the affected environment.

Adding the effects of alternative 2 in this project to the effects of ongoing and reasonable foreseeable future actions will reduce habitat for snag-associated species in the short term; in the long term, due to the deterioration of snags, this reduction will disappear.

Alternative 3

Direct Effects and Indirect Effects

The effects of alternative 3 are the same as for alternative 2 except alternative 3 increases the acreage of snag habitat to be retained in the short term because fewer acres of dead tree removal are proposed in this alternative. For snag-associated species, alternative 3 will remove about 1,595 acres of snag habitat created by the Little Deer Fire.

Cumulative Effects

Cumulative effects from adding the effects of alternative 3 to the effects of ongoing and reasonable foreseeable future activities are similar to those of alternative 2 even though more snags are retained in the short term in alternative 3.

Comparison of Effects

The effects of all alternatives to Forest Service sensitive species are displayed in table 3-13.

Table S- 2: Species status, effects, and determination for all alternatives

Species	Status	Effects to Habitat	Determination
Bald Eagle	Sensitive	No habitat affected	No effect
Northern Goshawk	Sensitive	No habitat affected	No effect
Greater Sandhill Crane	Sensitive	No habitat affected	No effect
Pallid Bat	Sensitive	Roosting habitat may be temporarily affected by noise disturbance.	May affect individuals, but is not likely to lead to a trend towards Federal listing
Townsend big-eared bat	Sensitive	Roosting habitat may be temporarily affected by noise disturbance.	May affect individuals, but is not likely to lead to a trend towards Federal listing
Fringed Myotis	Sensitive	Roosting habitat may be temporarily affected by noise disturbance.	May affect individuals, but is not likely to lead to a trend towards Federal listing
Western Bumblebee	Sensitive	No effect to habitat	No effect

Table S- 3: Comparison of short-term effects to snag-associated MIS species

Effects to Habitat	Alternative 1	Alternative 2	Alternative 3
Habitat removed	0 acres	1,798 acres	1,595 acres
Habitat retained	4,842 acres	3,044 acres	3,247 acres

Comparison of short-term effects of alternatives on snag-associated Management Indicator Species indicates that alternative 1 provides most short-term habitat, alternative 3 provides a moderate level of short-term habitat and alternative 2 provides a slightly smaller amount of short-term habitat than alternative 3. In the long term, there is little difference among alternatives with alternatives 2 and 3 providing more acres of habitat through reforestation of harvested areas.

Compliance with law, regulation, policy, and the Forest Plan

All action alternatives will be compliant with the Forest Plan guidelines aimed at minimizing short-term impacts to individuals and providing for long-term wildlife population persistence as displayed in the Forest Plan consistency checklist, available on the project website. The action alternatives propose measures which will move toward restoring ecosystem processes in the project area.

Compliance with the Migratory Bird Treaty Act is assured by compliance with the Migratory Bird Memorandum of Understanding. The Wildlife resource report discloses this compliance and concludes that the analysis of Forest Service Sensitive and Management Indicator Species birds is sufficient to ensure compliance with the Migratory Bird Treaty Act.

Compliance with the Endangered Species Act is not pertinent to this project since there are no known occurrences and no suitable habitat for federally-listed species in the project or analysis area. Compliance with the 2001 Record of Decision (as amended) concerning survey and manage species is also not pertinent as there are no known occurrences and no suitable habitat for survey and manage species.

Wildlife Resource Report

Introduction

The Little Deer Project was analyzed for its effects on wildlife species listed as Endangered, Threatened, or Proposed under the Endangered Species Act and designated Critical Habitat for those species; species listed as Region 5 Forest Service Sensitive; and Management Indicator Species selected for project level analysis. In addition, migratory bird memorandum of understanding and survey and manage were assessed for compliance.

The Little Deer Project is located eight miles west of Bray and about 12 miles southwest of Macdoel, California, in Siskiyou County (Figure 1) in Township 44 North, Range 2 West, Sections 3-10, 16-19; Township 45 North, Range 2 West, Sections 32 and 33; Township 44 North, Range 3 West, Sections 1, 12, 13, and 24, Mt. Diablo Meridian. The project is located within the 5th field Butte Creek and Parks Creek-Shasta River watersheds, the 6th field Horsethief Creek and Grass Lake watersheds, and the 7th field Grass Lake South, Grass Lake Northeast, Upper First Creek, Lower First Creek, Penoyar, and Horsethief Creek watersheds. Highway 97 runs adjacent to this project and travels through a small piece inside the project area.

The Little Deer Fire began on July 31, 2014 and was contained on August 11, 2014, burning about 5,503 acres. The project boundary follows the fire perimeter excluding sections of private land on the southwestern and northeastern sections of the fire. Treatment is also excluded from private property located within the project area.

Proposed Actions and Alternatives Analyzed

A description of the proposed actions is available in chapter 2 of the Environmental Assessment (EA).

Methodology

Methodology for the analysis included field review, review of the latest scientific research and literature, GIS analysis, and local expertise for the consideration of direct, indirect and cumulative effects. In general, throughout the analysis below, the term analysis area focuses on the distribution of effects relative to the wildlife species listed below. Based on field review and consideration of direct and indirect effects, the analysis area is defined as: the area directly affected by harvest (units) and the interrelated and interconnected activities and the area potentially affected by noise disturbance (up to ½ mile from noise generating equipment depending on topographic features which may limit noise). Project area refers directly to the area within the project area boundary described in the Proposed Action. Specific methods for each species' analysis are described below.

The perimeter of the project boundary essentially follows the fire perimeter. Some portions of the fire have been excluded from the project boundary because they are located on private land or within other planned project areas.

Federally Listed Species

A species list, from the United States Fish and Wildlife Service (USFWS), Arcata Field Office of Proposed, Endangered and Threatened species which may occur in or be affected by the

proposed project in the area within USGS quads ((USGS quads Grass Lake and Penoyar) (Document numbers: 913029837-16821 and 912997025-161024) generated on October 9, 2014. The following wildlife species were identified:

- Northern spotted owl (*Strix occidentalis caurina*) - Threatened
- Vernal pool fairy shrimp (*Branchinecta lynchi*) – Threatened
- Western yellow-billed cuckoo (*Coccyzus americanus*) - Threatened
- Gray wolf (*Canis lupus*) - Endangered

Western yellow-billed cuckoo are strongly associated with dense riparian vegetation typically composed of woodlands with low, scrubby, dense vegetation and surface water. In some areas, the cuckoo can be found in willow thickets or dogwood patches. On the Forest, cuckoo habitat is very limited in distribution to small areas along the Klamath River. The Forest has no record of cuckoo observation on the Forest and the closest observation is located on the Six Rivers National Forest near the mouth of the Eel River. In addition, the project area doesn't contain any proposed cuckoo critical habitat. The Little Deer Project contains no cuckoo habitat thus the project will have "no effect" on cuckoo or critical habitat.

The **Vernal Pool Fairy Shrimp** is a federally listed crustacean endemic to California and Oregon vernal pools. It inhabits small vernal pools with cool water (10ºC) of moderate alkalinity and conductivity that are less than 1m deep. Vernal pools are defined as temporary wetlands that form in depressions of unplowed grasslands over a hardpan clay layer. Pools fill with winter rains and evaporate over time, lasting anywhere from a few weeks to a few months (Gallagher 1996). As a result, this species completes its life cycle in a matter of weeks.

The current distribution of the vernal pool fairy shrimp is limited to Oregon and California. Populations are found in Southern Oregon's Agate Desert and in California's Central Valley and coastal mountains. Just three occurrences of are also found in Southern California. Relative to other fairy shrimp, this species has a relatively large distribution, but uncommon within its range. Historic data are nonexistent since it was described in 1990. Its distribution or abundance may have been much greater in the past, since vernal pools are currently an endangered habitat. California's Central Valley has lost 75% of its vernal pool habitat and Oregon's Agate Desert has lost 90% (Gallagher 1996).

The Little Deer project area does not contain vernal pools or hard pan, as described by on the ground verification by the project soil scientist. While the USFWS list generated for the USGS quad (Penoyar) indicated vernal pool fairy shrimp as a species with potential habitat, the specific project area does not contain this habitat. Therefore, the Little Deer Project activities will have "no effect" on vernal pool fairy shrimp or its Critical Habitat because the project doesn't occur in habitat.

The **gray wolf** was added to the species list after the GPS-collared wolf known as OR-7 dispersed from Oregon into California and then returned to Oregon. While OR-7's dispersal event suggests unmarked wolves may occur in California without our knowledge, OR-7 was the only recorded wolf in California since 1924 and was never recorded to have interacted with potential unmarked individuals in California. It is therefore highly unlikely that other wolves have become established in California. Additionally, OR-7's GPS data, although limited due to time span between locations, did not cross through the project area. Therefore, because there are

currently no known wolves in California and the only wolf known to have dispersed from Oregon didn't use the Project area, the Project will have "no effect" on gray wolves.

While the species list for the project area indicate gray wolf Critical Habitat present for the project area, further investigation has shown this to be an error because gray wolf Critical Habitat has not been designated in California. Therefore, it is my determination that the proposed Little Deer Project will have "no effect" on designated Critical Habitat for the gray wolf because the project area does not occur in gray wolf Critical Habitat.

The **Pacific fisher** is "proposed" threatened under the Endangered Species Act, but it is not likely to occur in the project area. The US Fish and Wildlife Service doesn't recognize the project area occurring in the species range thus the fisher will be evaluated as a Forest Sensitive Species.

Therefore, no threatened, endangered, or proposed species or critical habitat will be considered further in this analysis except the northern spotted owl.

Forest Service, Region 5 Forest Sensitive Species

These Forest Sensitive Species were assessed to determine the likelihood of occurrence in the Project Area based on the range of the species and suitable habitat within the Project Area.

- Northern goshawk (*Accipter gentilis*)
- Greater sandhill crane (*Grus canadensis tabida*)
- Pallid bat (*Antrozous pallidus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Western bumblebee (*Bombus occidentalis*)
- Fringed myotis (*Myotis thysanodes*)
- Willow flycatcher (*Empidonax trailii*)
- Pacific fisher (*Martes pennanti pacifica*)
- American marten (*Martes caurina*)
- North American wolverine (Gulo gulo luscus)
- Great gray owl (*Strix nebulosa*)
- Northwestern pond turtle (*Clemmys marmorata marmorata*)
- Foothill yellow-legged frog (*Rana boylii*)
- Cascade frog (*Rana cascade*)
- Southern torrent salamander (*Rhyacotriton variegatus*)
- Siskiyou Mountain salamander (*Plethodon stormi*)
- Tehama chaparral snail (*Trilobopsis tehamana*)

American marten tend to use high elevation (>5,000 feet), multi-storied mature and old growth conifer (white fir/red fir) forests with moderate to dense canopy closure. Habitat consisting of a dense overstory exceeding 70% with tree size of 24"dbh and sufficient understory including slash, rotten logs and stumps to provide hiding cover and denning areas is preferred. In most studies of habitat use, martens were found to prefer late-successional stands of mesic coniferous forest, especially those with complex physical structure near the ground (Buskirk and Powell

1994). Martens generally occupy stands that are located within ¼ mile from water with forest openings less than one acre in size. They generally avoid habitats that lack overhead cover, and tend to avoid crossing large openings (> 300 meters), especially in winter. The project area was not suitable habitat prior to the wildfire and continues to lack important habitat elements such as canopy cover, tree species composition, elevational parameter, stand decadence, and thermal cover. The nearest marten sighting is 8.5 miles west of the project area boundary. Therefore, habitat needs for American marten are not met within the project area and they are not expected to occur within the project area. Therefore, this species will not be further considered in this analysis.

Wolverines are known to inhabit large, sparsely inhabited wilderness areas, and are considered rare in California. Wolverines likely also use red fir, subalpine conifer, alpine dwarf-shrub, lodgepole, wet meadow, Jeffrey pine and montane riparian habitats (Schempf and White 1977; Zeiner 1990). The Klamath Forest Plan does not provide specific guidelines for this species; however, general guidelines direct improvement of habitat capable of producing mature and over mature eastside pine, mountain meadows, mature/over mature forest, and riparian habitats. None of this habitat type is present in the project area. Due to the currently fragmented habitat within the project area and the existing level of human disturbance within the watershed, this species is not expected to occur within or adjacent to the project area. Therefore, this species will not be further considered in this analysis.

The **northwestern pond turtle**, **Cascade frog, foothill yellow-legged frog, and southern torrent salamander** are all species associated with either a permanent source of water or riparian vegetation, neither of which occurs within the analysis area. Water availability is very limited within the analysis area. There are no intermittent or perennial streams or water bodies within the project area and no riparian vegetation. The project hydrologist report indicates that there is little to no surface hydrologic connectivity between project units and any riparian reserve or channel outside of the project area. There is a small stock pond in the project area that contains water during a portion of the year, but even in years of abundant precipitation, this pond doesn't likely provide a reliable water source or riparian vegetation. Therefore, this species will not be further considered in this analysis.

Great gray owls require large, high mountain meadows (> 10 acres) surrounded by large, late successional or mature mixed conifer forests. It uses large montane meadows for foraging and is dependent on old growth red fir, mixed conifer, or lodgepole pine for nesting (Duncan 1997, Hayward et al 1994, Bull et al 1989, Bryan and Forsman 1987). In California, it is most often seen in wet meadows of the Sierra Nevada and has also been occasionally documented in northwestern California in winter and in the Warner Mountains in summer. The only confirmed great gray owl on the Goosenest Ranger District was found dead on Highway 97 at Grass Lake in 1989 and believed to be a rare occurrence. No great gray owls have been detected during numerous surveys on the district. Small aspen groves are present within the project area; the largest grove is about three acres. These groves are contained by lava flows and will not be affected by this project and are too small to provide great gray owl habitat. There is no suitable habitat for this species in the project area. Therefore, this species will not be further considered in this analysis.

Siskiyou Mountain salamander is commonly found in or near talus or rocky outcrops where moisture and humidity are high. These types of habitats are mostly found in denser north facing conifer forests. The Little Deer Project area has no known detections of this species and the

closest known site (>20 miles) is located in a disconnected mountain range separated by a moderate sized valley. In addition, no habitat as described exists in the project area. Therefore, this species will not be further considered in this analysis.

The west coast population of the **Pacific fisher** was proposed for federal threatened status on October 7, 2014. The fisher is closely tied with dense, structurally complex, low- to mid-elevation forests with a high total forest biomass (i.e. high amount of large trees) (Powell and Zielinski 1994, Zielinski et al.2004a, 2004b). Fishers are also closely tied to drainage bottoms (Yeager 2005), riparian areas, and select for resting sites that are rarely more than 1,100 feet from water (Self 2001). For denning, fishers often use hardwoods, particularly black oaks because hardwoods provide large, naturally occurring cavities (Zielinski 2004). Suitable habitat on the Forest is mid-to-low elevation, late seral and old growth coniferous stands. Habitat needs for the fisher are not met within the project area. The project area burned at a moderate to high severity and lacks important habitat elements such as canopy cover, stand decadence, overall forest biomass, and thermal cover. In addition, there is no water or riparian habitat within or adjacent to the project area. There are no current or historical sightings in or near the project area. In addition, there are no fisher detections on the Goosenest Ranger District recorded in the Nature Mapping Foundation database, within district records, or in the fisher meta-analysis (US FWS 2014). The closest detections were on the Salmon River and Scott River Ranger District. Therefore, this species will not be further considered in this analysis.

The **Tehama Chaparral** snail is generally associated with deciduous leaf litter near talus or outcrops within mature forest habitats, but has also been found under leaf litter and woody debris. The distribution of this species is very limited. Since 1999, well over 30,000 acres of pre-project surveys for terrestrial mollusks have occurred on the Forest. In 1999 and 2000, about 100 randomly selected 10- acre plots were surveyed for terrestrial mollusks. These recent surveys located several new sites. Currently, Tehama chaparral snails are known in 11 sites in Northern California (eight sites in Siskiyou County, and other older sites: one in Tehama County, one in Shasta County, and one in Butte County). On the Forest, the occurrence of rock as a dominant surface and subsurface feature is common to all known sites. Rocks and large woody material may serve as refugia when environmental conditions at the surface are not optimal (Duncan et al. 2003).

The project area was dry eastside pine that burned at a moderate to high severity and lacks important habitat elements such as overall forest biomass, including large woody downed material, and talus sites. There are no current or historical sightings in or near the project area. Therefore, this species will not be further considered in this analysis.

The **Willow Flycatcher** is a "rare to locally uncommon" summer resident in wet meadow and montane riparian habitats at 2000–8000' in the Sierra Nevada and Cascade Range. In California, this species most often occurs in broad, open river valleys or large mountain meadows with lush, high-foliage volume willows (Harris et al. 1987).

As a neotropical migrant species, the willow flycatcher breeds in riparian and mesic upland thickets in the United States and Canada, wintering from Veracruz and Oaxaca, Mexico south to Panama (AOU, 1983). Breeding habitat in California is typically moist meadows with perennial streams, lowland riparian woodlands dominated by willows, cottonwoods, or in smaller spring fed boggy areas with willow or alders (Harris et al. 1987). The presence of water during the breeding season appears to be an important habitat component (Fowler et al., 1991). Willow

flycatchers have been found in riparian habitats of various types and sizes, ranging from small willow surrounded lakes or ponds with a fringe of meadow, to grasslands, to willow lined streams or boggy areas. Both destruction of riparian habitats and nest parasitism from brown-headed cowbirds have been implicated in the decline of this species.

The project area burned at a moderate to high severity and lacks important habitat elements such as willows or cottonwoods associated with water or riparian habitat within or adjacent to the project area. There are no current or historical sightings in or near the project area.

Therefore, the **bald eagle, northern goshawk, greater sandhill crane, western bumblebee, Townsend's big-eared bat, fringed myotis, and pallid bat** are the only Forest Sensitive species analyzed in this document because the project area is within the species range and the project may have direct or indirect effects on the species.

Analysis Indicators

Bald Eagle

Spatial bounding for this analysis is defined by the areas directly affected by tree removal and the area potentially impacted by noise disturbance because the remaining aspects of the proposed activities are not pertinent to the protection of nesting or roosting bald eagles or the management of eagle habitat. Other aspects of the proposed actions do not impact suitable eagle nesting, foraging or roosting habitat. The bald eagle nests described above are located far enough from the project area that impacts from the proposed activities are not anticipated. Prey for bald eagles in this area can be found a wide variety of habitat types and it is unlikely that any one habitat type would be measurably impacted by the proposed activities such as browse planting as to affect the availability of prey for eagles.

Temporal bounding for the analysis is both short term and long term. The short term bounding is the time of project implementation (likely two seasons of operation) because it is tied directly to the potential for noise disturbance. Long term bounding is the time needed for a coniferous forest overstory to recover from a severe wildfire.

Dead tree/overstory removal is not pertinent to the analysis because it would not be occurring in areas of suitable eagle habitat. The project design reflects the use of management guidelines within National Bald Eagle Management Guidelines (USDI 2007), the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act and implementation of the standards and guides for bald eagles in the Forest Plan that minimize impacts to this species. Therefore, the pertinent indicators for the effects analysis to bald eagles are 1) disturbance and 2) overstory recovery.

Northern Goshawk

Spatial bounding for this analysis is defined by the areas directly affected by tree removal and the area potentially impacted by noise disturbance because the remaining aspects of the proposed activities are not pertinent to the protection of nesting goshawks or the management of goshawk habitat. Other aspects of the proposed actions do not impact suitable goshawk nesting or foraging habitat. Prey for goshawks in this area can be found in a wide variety of habitat types and it is unlikely that any one habitat type would be measurably impacted by the proposed activities, such as browse planting, as to affect the prey availability.

Temporal bounding for the analysis is both short term and long term. The short term bounding is the time of project implementation (likely two seasons of operation) because it is tied directly to the potential for noise disturbance. Long term bounding is the time needed for a coniferous forest overstory to recover from a severe wildfire. Therefore, the pertinent indicators for the effects analysis to goshawk are 1) disturbance and 2) over-story recovery.

Greater Sandhill Crane

Spatial bounding for this analysis is a ½ mile buffer around treatment units. Grass Lake, which is adjacent to the project area, is known to provide habitat for sandhill cranes. For this analysis the topography and the juxtaposition of Grass Lake to the proposed activities would generate noise, and thereby disturb any cranes that may occupy Grass Lake meadow, was considered. Because no activities would occur within sandhill crane habitat (i.e. meadow), and the only foreseeable impacts from the proposed project would be associated with noise disturbance, this bounding was deemed appropriate. Temporal bounding is the time associated with the tree removal aspect of project implementation (likely two operating seasons), because the only potential impacts from the project would be from noise during operations. Therefore, the pertinent indicators for the effects analysis to greater sandhill crane are 1) noise disturbance.

Pallid Bat, Townsend's Big-Eared Bat, and Fringed Myotis

The life histories of all three bat species are similar; therefore the methods for analysis are the same. Spatial bounding for this analysis is defined by the areas directly affected by tree removal and the area potentially impacted by noise disturbance because these aspects of the proposed activities are most pertinent to the management or protection of these three bat species and their habitat. Other aspects of the proposed actions do not impact suitable bat habitat for these three species. Temporal bounding for the analysis is the time of project implementation (likely two seasons of operation) because it is tied directly to the potential for noise disturbance. Therefore, the pertinent indicators for the effects analysis to pallid bat, Townsend's big-eared bat, and fringed myotis bats are 1) disturbance and 2) removal of roost structures.

Western Bumblebee

Spatial bounding for this species is defined by the treatment units where equipment may affect bee habitat and foraging. Temporal bounding for the analysis is the time of project implementation (likely two seasons of operation) because it is tied directly to the time of implementation. Therefore, the pertinent indicators for the effects analysis to western bumblebee are 1) disturbance of meadows or openings.

Affected Environment

The Little Deer Fire was an uncharacteristically intense wildland fire that resulted in severe tree mortality throughout much of the project area (about 82%). Prior to the Little Deer Fire, the project area was dominated by pine and shrubs like antelope bitterbrush, manzanita, curl leaf mountain mahogany, rabbit brush, and various ceonothus species. The fire, however, resulted in a majority of conifers and shrubs within fire perimeter dead or dying.

Even though some of the trees appear to be currently alive because a portion of the tree crown contains green needles, we expect continued mortality within the burn perimeter as the effects of the fire continue to weaken the trees and possibly in unburned islands as stressed trees succumb to insects (i.e., western and mountain pine beetle).

Areas within the project with abundant tree mortality may be slow to recover due to lack of seed, rocky soil, and limited rain fall. In addition, heavy fuel loading resulting from fallen snags in the project area may impede conifer development as this fuel loading is expected to produce higher fire severity in the next fire when compared to other pine forests that experience high frequency and low intensity fire cycle.

For foraging species, the fire has reduced forage availability in much of the treatment area: early seral vegetation will not be available for approximately ten years.

Environmental Consequences for Federally Listed Species

Northern Spotted Owl (NSO)

The project area is not within 2012 designated Critical Habitat for the northern spotted owl. Even though the list of threatened and endangered species and critical habitat produced by FWS indicates northern spotted owl Critical Habitat is present in project area, further investigation has shown this to be an error. The nearest Critical Habitat Unit is over 3.5 miles to the north of the project area. For this analysis, the analysis area is the Little Deer fire perimeter with a 0.25 mile buffer.

After assessing the analysis area for potential NSO habitat, we found no NSO habitat within analysis area. Even before the fire, the analysis area didn't contain suitable habitat (nesting/roosting or foraging habitat). The lack of habitat is consistent with the lack of NSO detections in the project area. The analysis area does not contain any current or historical northern spotted owl territories. The closest known NSO activity center is more than 4 miles from the project area. Therefore, an activity center analysis is not needed because the analysis area doesn't contain any portion of an NSO home range. The proposed treatments are too distant from the nearest NSO to possibly produce any measurable noise disturbance effects.

The predominant overstory tree species in the area is ponderosa pine, with some scattered pockets of incense cedar and white fir (see Silviculture report in Project file). Currently there is no suitable NSO nesting/roosting or foraging habitat present in the project area nor was it present before the Little Deer fire. Prior to the wildfire, there was about 70 acres of NSO dispersal habitat that contained some larger overstory white fir and incense cedar trees and canopy cover that was likely greater than 50%, but burned with high to moderate severity that would remove most or all canopy cover; NSO habitat needs at least 40% canopy cover. These areas were surrounded by non-habitat for northern spotted owls that also burned with moderate to high severity. Currently there are small areas of dispersal habitat within the analysis area (totaling about 10 acres), but outside the project area boundary with canopy closure greater than 50%, but these areas are too small and fragmented and lack forest structure to function as foraging NSO habitat, but may offer dispersal habitat.

Size and proximity of other suitable habitat must be considered when assessing NSO habitat suitability. Prior to the fire, the analysis area did not contain a large enough area of contiguous suitable habitat and was isolated from any other suitable habitat, that the overall habitat suitability is extremely low and would not have supported northern spotted owls. Given the habitat changes resulting from the Little Deer fire, these former areas of dispersal habitat burned with a very high severity and no longer contain habitat elements needed by NSOs to breed, feed, shelter, or disperse.

Habitat attributes such as coarse woody debris (CWD) for prey habitat and cover for foraging (multi-layered stands) can be altered drastically and be extremely limiting after intense wildfire. Replacement woody debris may be replenished from falling snags and trees or may remain in areas where fire intensity was less severe. Prey species abundance can be affected by the immediate changes in habitat or direct kill associated with wildland fires. Additionally, burned forested stands lack protection from weather and predators and will take many years to re-establish the multi-layered stands necessary to compliment other essential suitable habitat attributes as described above. In the project area, the site conditions for tree growth will likely limit the area to producing only dispersal habitat that is isolated from any nearby habitat.

Survey Information

No recent NSO surveys were conducted for the proposed project because the project area contains no territories, no historical sightings and no suitable habitat.

Alternative 1, 2 and 3

Direct Effects and Indirect Effects

Because the analysis area did not contain NSO territories, suitable nesting/roosting habitat, or any historical sighting information, it is highly unlikely that any NSOs occupied the area prior to the wildfire. Further, the Little Deer fire burned with a severity that is uncharacteristic for this region (see Little Deer Project Fuels Report) and resulted in extensive mortality over 82% of the burned area and it is now even less likely that NSOs would occupy or inhabit the analysis area. In addition, no NSO activity centers, using the 1.3 mile radius home range, intersect the analysis area. Therefore, it is highly unlikely NSO will use the project area for any purpose and it is unlikely NSO habitat will exist in the project area for several decades.

Cumulative Effects

Because there are no direct or indirect effects expected from the proposed alternatives, there are no cumulative effects expected.

Summary of Effects

There is no suitable northern spotted owl habitat within the proposed treatment units. All units are located within high or moderate intensity burned areas that did not contain suitable NSO nesting/roosting or foraging habitat prior to the wildfire. The proposed project will not affect suitable nesting/roosting or foraging northern spotted owl habitat. There will be no effect from noise or disturbance from any of the action alternatives, due to the distance and topography between the closest NSO activity center (>4 miles) or suitable nesting/roosting habitat and proposed treatments.

It is my determination that Alternative 1 and the proposed action alternatives (Alternatives 2 and 3) of the Little Deer Project will have "**no affect**" on northern spotted owls because the project will occur in non-habitat, there is no suitable nesting/roosting or foraging habitat within the project area, and the distance to the nearest NSO activity center is over 4 miles from the project area, thereby eliminating the potential for noise disturbance.

There are no northern spotted owl nests, territories or sightings in the project area, nor is there any U.S. Fish and Wildlife Service designated Critical Habitat.

It is my determination that Alternative 1 and the proposed action alternatives (Alternatives 2 and 3) will have "**no effect**" on designated Critical Habitat for the northern spotted owl because the project area does not occur in the NSO Critical Habitat.

Environmental Consequences for Region 5, Forest Service Sensitive Species

The following species will be addressed below due to the presence of current or historical sightings, the presence of suitable habitat prior to the wildfire, or the presence of suitable habitat after the wildfire and because the project falls within the current range or distribution of the species.

Bald Eagle

The bald eagle was listed in 1967 under legislation that preceded the Endangered Species Act, and was officially listed as Endangered when the Act was signed into law in 1973. It was listed as Endangered in the lower forty-eight states of the United States because of a severe decline in numbers. This decline was primarily attributed to the use of certain pesticides which caused reproductive dysfunction and eggshell thinning. Habitat loss and disturbance at nest and roost sites were also major factors. Eagle populations have rebounded since the banning of DDT and the increased protection for nesting and winter roosting habitat. The bald eagle was removed from the Endangered Species List by the USFWS on July 9, 2007 and is now managed as a FS Sensitive Species. Viability of this species on the Forest is expected to be provided through implementation of the National Bald Eagle Management Guidelines (USDI 2007), the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act and implementation of the standards and guides for bald eagles in the Forest Plan.

Nesting territories are generally associated with lakes, reservoirs, rivers, or large streams. However, on the dry, eastside pine and bitterbrush/sagebrush/mountain mahogany habitats of the Goosenest Ranger District, eagles tend to choose anomalous habitats along slopes that are adjacent to flat, open areas that have no large bodies of water, for both nesting and winter roosts. These areas provide an abundance of Belding's ground squirrels and rodents that provide sufficient prey availability as to attract eagles to uncharacteristic habitats. However, other aspects that are more typical of eagle habitat are selected for in these areas, such as large overstory pines with direct lines of sight to foraging areas and large diameter, large limbed snags in close proximity to nest trees that function as pilot trees for territory and nest defense.

The nearest bald eagle nests to the project area are the Grass Lake bald eagle nest about 2 miles west of the project on private land and the Mt. Hebron nest about 3 miles to the northeast of the project area. There are no known nests or roosts within the project area.

Alternative 1

Direct Effects and Indirect Effects

Indicator 1) Disturbance – There would be no effects from this alternative because no activities would take place, thus no disturbance.

Indicator 2) Overstory recovery –Young trees would compete with sprouting brush and other early seral plant species and the seral stage process would take place thus increasing the time

needed for the forest to develop into possible eagle habitat. In addition, any green trees remaining post-fire on slopes with direct lines of sight to foraging areas and large diameter, large limbed snags in close proximity would be the future overstory trees that may offer nest opportunities for bald eagles.

Cumulative Effects

Because there are no direct or indirect effects expected from the proposed alternatives, there are no cumulative effects expected.

It is my determination that

Alternative 2 and 3

Direct Effects and Indirect Effects

Alternatives 2 and 3 differ in acres treated by dead tree removal or reforestation. The difference in acres treated will not result in a large difference in effects to eagle habitat.

Indicator 1) Disturbance - Prior to wildfire, the western portion of the project area contained mid-seral ponderosa pine, interspersed with brush, rocky knolls, and regenerating pine – none of which is suitable bald eagle habitat. The remaining portions of the project area are not suitable for eagles due to a lack of large overstory trees in conjunction with suitable foraging areas, as described above. Therefore, it is unlikely that eagles will be disturbed during project activities. If an eagle nest is found, then seasonal restrictions will be applied to minimize impacts to eagles.

Indicator 2) Overstory Recovery – Reforestation of the areas burned with high severity during the Little Deer wildfire will enable the coniferous overstory to recover more quickly than if left untreated. Although difficult to estimate, it is assumed that the sooner habitat ***regenerates into*** eagle habitat, the better it will be for eagles. Alternative 3 reforests 1,595 acres compared to 1,952 acres which may slow overstory development compared to Alternative 2.

Cumulative Effects

Cumulative effects from the proposed action alternatives are analyzed together because the issues described above for bald eagles are not measurably different between alternatives in terms of effects to bald eagles. The cumulative effects analysis is spatially bounded by a ½ mile buffer surrounding the area utilized by eagles during winter months and during breeding season, because of the specialized habitat needs (such as large diameter, large limbed trees in close proximity and within line of sight to open foraging areas) that only certain areas within the analysis area would provide. Activities that generate noise above ambient levels within this bounding would be accounted for in this analysis. Because of these specific habitat requirements, without which an area would not be considered suitable, an analysis of a larger area such as a watershed boundary would dilute effects to eagles to the extent that impacts would not be identifiable. The scope of the analysis for eagles is directly related to the scope of the impacts to these specific habitat requirements.

Temporal bounding is both short term such that any action that would overlap in space and time with the Little Deer Restoration project would be accounted for in this analysis, and long term in that future foreseeable actions planned for the same analysis area would also be captured.

Private land owners that own the section of land within the project area boundary (e.g. Fruit Growers Timber Company) actively harvest timber from their lands and have Timber Harvest Plans on file with the State. The private land that was burned during the Little Deer fire has already been harvested. At this time it is unknown whether owners of additional private land within the project boundary will harvest trees on their land. Possible re-entry or reforestation efforts may occur, and could overlap in space and time with Alternatives 2 and 3.

It is my determination that Alternatives 2 and 3 will have *no effect* to bald eagles because there are no known eagle nests within the project and there is no suitable habitat.

Northern Goshawk

Northern goshawks can be found in middle and higher elevation mature coniferous forests, usually with little understory vegetation and flat or moderately sloping terrain. Moderate and high quality habitats contain abundant large snags and large logs for prey habitat and plucking posts (Squires and Reynolds 1997). Goshawks generally breed in mature, coniferous, mixed, and deciduous forest habitats. This habitat provides large trees for nesting, a closed canopy for protection and thermal cover, and open spaces allowing maneuverability below the canopy (Squires and Reynolds 1997). Territories associated with large contiguous forest patches were more consistently occupied compared to highly fragmented stands (Woodbridge and Detrich 1994). Threats to goshawks include destruction of nests by harvest activities and disturbance near nest sites during sensitive nesting periods. Harvest methods that create large areas of reduced forest canopy cover may be especially detrimental (Squires and Reynolds 1997).

On the Forest, habitat consists of mid- and late-successional mixed conifer forest with scattered harvested and natural openings. Many of the known goshawk sites are associated with northern spotted owl sites and goshawks have been found incidentally while surveying for owls. Foraging habitat is variable and includes mid- and late-successional forest, natural and man-made openings, and forest edges.

There are no known northern goshawk territories in the analysis area. There is no suitable nesting or foraging habitat within the proposed project area. A small amount of potential foraging habitat exists adjacent to the burn areas, along the edge where forested stands meet the lightly burned or unburned areas. Small pockets within these areas may provide marginal nesting habitat, though it is unlikely that these areas could support nesting goshawks due to their small size and fragmented position on the landscape.

Prior to wildfire, the eastern portion of the project area contained open stands of ponderosa pine interspersed with brush, rocky knolls, and regenerating pine – none of which is suitable goshawk habitat. The northern portion of the project area may have contained ***about 70 acres of foraging*** habitat prior to the burn. However, these areas burned with high and moderate severity and are currently not goshawk habitat. Habitat elements necessary for goshawk survival and reproduction (described above) are no longer present in the project area. Use of burned forests by goshawks has not been documented in current research.

The closest active goshawk nest is about 2 miles from the project boundary. One historic territory that was last active in 2004 is about 0.5 miles away from the project boundary. The current habitat condition for this historic nest location is poor thus this nest site is not likely to be active again until habitat conditions improve. There are no known goshawk territories within the

project area. If nesting goshawks are discovered in the project within 0.5 miles of project treatment units seasonal restrictions would be in place to alleviate any possible noise disturbance.

Dead tree/overstory removal is not pertinent to the analysis because it would not be occurring in areas of suitable goshawk habitat. Proposed action alternatives vary by the level at which snags will be retained, but these effects would be very difficult to quantify for goshawk. However, snag retention is pertinent in that the more large snags retained within the project area, the higher the likelihood that some of these will persist into the future stand and be important habitat components of future goshawk habitat.

Therefore, the pertinent analysis indicators for the effects analysis to goshawks are 1) disturbance 2) overstory recovery and 3) snag retention.

Alternative 1

Direct Effects and Indirect Effects

Indicator 1) Disturbance – There would be no direct impacts in the form of disturbance to goshawks from the No Action alternative because no activities would take place.

Indicator 2) Overstory Recovery – Indirect effects of the No Action alternative would be the slower regeneration of the conifer forest where the canopy was lost to high severity fire. With no reforestation treatment, the mature forest habitat preferred by the goshawk would eventually return, though at a slower rate as the successional stages of forest regeneration pass. The impacts of a slower regeneration time are unknown, particularly because there are no known territories within or adjacent to the analysis area.

Indicator 3) Snag Retention – All dead trees would be retained because no tree removal would occur. This may however inhibit the recovery of the overstory by not allowing sufficient available surface for reseeding. The impacts to goshawks of retaining all possible snags in the area are not known.

Cumulative Effects

Because there are no direct or indirect effects expected from the proposed alternatives, there are no cumulative effects expected.

It is my determination that Alternative 1 will have no direct, indirect, or cumulative effect on goshawks.

Alternative 2

Direct Effects and Indirect Effects

Indicator 1) Disturbance – There are no known active northern goshawk nests, or Goshawk Management Areas (GOMA) within or adjacent to the project area. There is a historic goshawk territory about 0.5 miles from the project boundary but it has been inactive for over ten years. There are two known active goshawk territories, one southeast and one northwest; both are about 2 miles from the project area boundary. The project area is primarily bordered by eastside pine and does not provide goshawk habitat.

There are no known active goshawk nest sites in or adjacent to the project area. If nest sites are discovered prior to or during project implementation Standards and Guides within the Forest

Plan will be applied and protective measures regarding noise disturbance would be implemented (i.e. no project activities within ¼ mile of the nest site between 3/1 and 8/31). See Project Design Features in the EA.

Indicator 2) Overstory Recovery – Indirect effects from a project are generally associated with habitat modification or removal and subsequent impacts to the viability of the individual or population of the species. Because no suitable nesting or foraging habitat for goshawks will be modified or removed with the proposed project, no indirect effects are expected. Replanting the burned area will allow the landscape to attain late-seral characteristics faster than if left untreated. Components of this species' habitat such as snags and coarse woody material will be retained to meet or exceed Forest Plan standards and guidelines (see Project Design Features in EA). These components may be important to the future stand as they would provide structure for prey and foraging opportunities.

Indicator 3) Snag Retention – This alternative will remove 1,798 acres of snags (including 135 acres of public firewood). This represents 37% of the Little Deer fire. Because snags and large downed logs are components of goshawk habitat and these may be part of the future stand, it is likely beneficial to have multiple snags retained, though a specific quantity that would be the most beneficial is difficult to estimate. The more large snags retained within the project area, the higher the likelihood that some of these would persist into the future stand and be important habitat components of future goshawk habitat. Details of snag retention for all alternatives can be found in the project file.

Alternative 3

Direct Effects and Indirect Effects

This alternative reduces the acres of dead trees harvested to 1,595 acres (including 47 acres of public firewood), and more snags will remain: dead trees will be removed on 33% of project area. The minimum number of snags to be retained in areas where tree removal is planned will remain the same for both action alternatives: ≥ 10 snags/ac, up to 1,000 snags >28” dbh within the treatment area, and all incense cedar >16” dbh.

Indicator 3) Snag Retention – Dead tree harvest is reduced to 1595 acres in Alternative 3. Because snags and large downed logs are components of goshawk habitat and these will be part of the future stand, it is likely beneficial to have multiple snags retained, though a specific quantity that would be the most beneficial is difficult to estimate. The more large snags retained within the project area, the higher the likelihood that some of these will persist into the future stand and be important habitat components of future goshawk habitat. So, this alternative may provide a better opportunity for snags and large downed logs to be present in the future stand.

Alternatives 2 and 3

Cumulative Effects

Because the only anticipated, potential impact from the proposed project is disturbance during project implementation, the temporal bounding for the cumulative effects analysis for this species is the implementation timeframe for the project activities. Baseline habitat conditions in the analysis area are a product of the intensive timber harvest practices of the mid to late 1900’s and a large, high intensity wildfire. Goshawk habitat baseline would not change any more than

what was already incurred due to the wildfire because the area is no longer suitable habitat and because no suitable habitat would be removed or modified with the proposed activities.

This analysis is spatially bounded by the area potentially affected by noise disturbance. Any ongoing activities in addition to the proposed project activities that would contribute to noise levels above ambient levels could negatively impact any goshawks during nesting that may using the area surrounding the project area. Guidelines in the Forest Plan provide ¼ mile protection buffers from all noise and smoke generating projects when they are adjacent to either suitable or known occupied nesting habitat. Therefore, these distances will provide the spatial bounding for the analysis of cumulative impacts for this project.

In addition, private land holders that own the sections of land within the project area boundary (i.e. Fruit Growers Company and other individual private landowners) actively salvage harvest timber from their lands and have Timber Harvest Plans on file with the State. Some of the private land that was burned during the Little Deer fire has already been harvested. Possible re-entry or reforestation efforts may occur, and may overlap in space and time with Alternatives 2 and 3 if they were to implement during late summer to early winter. If goshawks are present in suitable habitat outside the project area but within close proximity to private lands, they may be disturbed and/or displaced during implementation.

It is my determination that the cumulative effects of Alternatives 2 and 3 may impact individual goshawks if present in the area, but will not lead to a trend to federal listing or a loss of viability. The impacts to goshawks are mostly centered on possible noise disturbance of goshawk outside the project area. It is highly unlikely a goshawk would nest in the project area and the very limited amount of foraging habitat adjacent to the project area is not likely to support goshawk nesting either. . Other than these differences, the activities proposed are essentially the same, including the Project Design Features, as well as the effects described above for the Proposed Action.

Greater Sandhill Crane

Greater sandhill cranes breed in wetlands and feed in meadows, irrigated pastures, grain fields, bogs, marshes, and open grasslands. Cranes roost at night in open expanses of shallow water. Nests are generally on the ground on dirt mounds or piles of sticks. Greater sandhill cranes migrate in the spring to their breeding grounds and show a high fidelity to nesting areas. Migration also occurs in the fall, after breeding and rearing young, where they spend the winter in the Central Valley of California. Food items include roots, tubers, seeds, small vertebrates, worms, and insects (NatureServe 2009).

Grass Lake is a large wetland that lies ***west*** of the area burned in the Little Deer fire. A very small portion (<5 acres) of the eastern edge of Grass Lake is about 0.25 miles from the project boundary. Some portions of Grass Lake contain standing water for extended periods of the spring and summer season, as preferred by nesting cranes. Cranes have been documented in the Grass Lake area on the north side of Highway 97.

The Forest Plan does not provide specific guidance for management of sandhill cranes, so there are no Limited Operating Periods assigned within the Standard and Guides. However, Forest Plan Standard 8-18 states “Avoid or minimize impacts to Sensitive species where possible. If impacts cannot be avoided, analyze the potential effects on the population or its habitat within

the landscape and on the species as a whole. Projects should not jeopardize species viability or create significant trends toward the need for Federal listing (FSM 2670.22) of Sensitive species".

Therefore, the pertinent indicator for the effects analysis to greater sandhill cranes is 1) disturbance.

Alternative 1

Direct Effects and Indirect Effects

Indicator 1) Disturbance – There would be no effects from this alternative because no activities would take place, thus no disturbance.

Cumulative Effects

Because there are no direct or indirect effects expected from the proposed alternatives, there are no cumulative effects expected.

It is my determination that Alternative 1 will have no direct, indirect, or cumulative effects on greater sandhill cranes.

Alternatives 2 and 3

Direct Effects and Indirect Effects

Indicator 1) Disturbance – A small portion of the project area, including part of treatment unit 718-89, falls within the 0.5 mile buffer of Grass Lake. The proposed activities are not directly within or adjacent to meadow habitat, disturbance in the form of direct contact or mortality is very unlikely. Disturbance may occur from noise during operations in the units that are nearest to the meadow (units on the far southern portion of the project area). Unit 718-89 is proposed for tree removal and reforestation and would be the only unit likely to impact any cranes that may be using the meadow because of proximity to the meadow. However, harvest operations are anticipated to take place late summer-early winter, at which time the cranes would not be in the meadow, due to their winter migration to the Central Valley. If project activities occurred during sandhill crane nesting and breeding season LOPs would be in effect for unit 718-89. Therefore, no impacts are expected from disturbance from this alternative.

Cumulative Effects

Temporal bounding for this analysis is defined by both those actions in the reasonably foreseeable future and by the total time of the tree removal aspect of project implementation (two season of operation) because the disturbance from project implementation would be the source of the majority of impacts to sandhill cranes by the proposed project. Because impacts would be disturbance-oriented, the analysis is spatially bounded by the area that would potentially be impacted by noise disturbance from the proposed actions, up to ½ mile of project area boundary, such that projects that would overlap in space and time and would generate noise above ambient levels within this bounding would be accounted for in this analysis.

Any on-going activities in addition to the proposed project activities that may occur near the meadow could contribute to noise levels above ambient levels and negatively impact any sandhill cranes that may using the meadow. However, untreated portions of the project area is not receiving treatment lie between harvest units and Grass Lake meadow and could provide

some buffer if cranes were present. Projects listed as reasonably foreseeable future or concurrent actions within the Little Deer project area are further from Grass Lake.

Existing private lands within the project area are >0.5 miles from the Grass Lake meadow, therefore harvest on those lands is not expected to disturb cranes. There are no other private or federal activities planned in the reasonably foreseeable future that would overlap in time and space with the Little Deer Restoration project and have impacts to greater sandhill cranes.

It is my determination for greater sandhill cranes that the actions proposed in Alternatives 2 and 3 for the Little Deer Restoration Project will have *"no effect"* to sandhill cranes.

Pallid Bat

Throughout California, the pallid bat is usually found in low to middle elevation habitats below 6,000 ft. however, the species has been found up to 10,000 ft. in the Sierra Nevada (Sherwin 2000). Varieties of habitats are used, including grasslands, shrublands, woodlands, and coniferous forests (Sherwin 2005). Pallid bats most often occur in open, dry habitats that contain rocky areas for roosting. They are a yearlong resident in most of their range and hibernate in winter near their summer roost (Zeiner 1990). Populations have declined in California within desert areas in areas of urban expansion, and where oak woodlands have been lost (Pierson 2007).

Foraging associations include edge habitats along streams and areas adjacent to and within a variety of wooded habitats (Sherwin 1998).

Day roosts may vary but are commonly found in rock crevices, tree hollows, mines, caves and a variety of human-made structures. Tree roosting has been documented in large conifer snags, inside basal hollows of redwoods and giant sequoias, and bole cavities in oaks (Pierson 2007, Gellman and Zielinski 1996). Cavities in broken branches of black oak are very important and there is a strong association with black oak for roosting (Pierson 2007). Roosts have warm, stable temperatures and are generally high above the ground. Roost sites must protect bats from high temperatures, as the species is intolerant of roosts in excess of 104 degrees Fahrenheit.

Night roosts are usually more open sites and may include open buildings, porches, mines, caves, and under bridges (Sherwin 2005, Pierson 2007). These are usually located within or near (< 1.5 km) foraging areas and within 2 km of water (PBRT 2008). Although year-to-year and night-to-night roost reuse is common, they may switch day roosts on a daily and seasonal basis (Sherwin 2005).

Winter habits are poorly known, but this species apparently does not migrate long distances between summer and winter sites. Sherwin (2005) found that in coastal California, males and females overwinter in a primary roost but occasionally use alternate roosts throughout the winter. Overwintering roosts have relatively cool, stable temperatures and are located in protected structures beneath the forest canopy, out of direct sunlight. In other parts of the species' range, males and females have been found hibernating alone or in small groups, wedged deeply into narrow fissures in mines, caves, and buildings.

Pallid bats are sensitive to disturbance and if they are persistently or severely disturbed, they may vacate roosts (PBRT 2008, Sherwin 2005). Disturbances at bat roosts can have severe bioenergetic consequences for bats, particularly when disturbances occur at hibernacula.

This bat species' tendency to roost in groups and their sensitivity to disturbance make them vulnerable to mass displacement. Roosts and hibernacula can be damaged or destroyed by vandalism, mine closures and reclamation, recreational rock climbing, and timber harvest (Sherwin 2005). Maternity colonies and hibernating bats are especially susceptible to disturbance. Loss or modification of foraging habitat due to fire, urban development, agricultural expansion, and/or pesticide use poses potential threats (Sherwin 2005).

The Forest Plan has standards and guidelines for the pallid bat (8-39), which require protection of caves, mines and abandoned wooden bridges, and buildings for the presence of roosting bats. As an interim measure, all timber harvest is prohibited within 250 feet of sites containing bats. The Forest Plan also states protection measures should be taken to disallow destruction, vandalism, disturbance from road construction or blasting, or any other activity that could change cave or mine temperatures or drainage patterns.

Pallid bats are known to occur in Siskiyou County and most likely occur on the Goosenest Ranger District. Habitat for pallid bats exists within the project area in the form of snags and rock crevices. However, other habitat elements that are important to this species such as oaks (with cavities) and cave or cave-like structures are not likely present. Another limiting factor for suitability of the project area may be the lack of available open water for drinking and foraging.

While there are no mines, caves, or human made structures, suitable large rock outcroppings are present within or adjacent to the proposed project area and the presence of numerous dead and dying trees and rock crevices, could potentially provide roosting structures. There have been no surveys for the pallid bat within or adjacent to the project area. There are no sightings and no known roosts within or adjacent to the project area or on the Goosenest Ranger District.

Proposed activities would be occurring in suitable pallid bat habitat and the species may be present, though there are no known roosts or sightings in the area.

Based on the discussion above, the pertinent indicators to the analysis of effects to pallid bats from the proposed activities are 1) disturbance at roost sites 2) removal of roost structures.

Alternative 1

Direct Effects and Indirect Effects

Indicator 1) Disturbance at roost sites – There would be no effects from this alternative because no activities would take place, thus no disturbance.

Indicator 2) Removal of roost structures – There would be no effects from this alternative because no activities would take place, thus no roost structures would be removed.

Cumulative Effects

Because there are no direct or indirect effects expected from the proposed alternatives, there are no cumulative effects expected.

It is my determination that Alternative 1 will have no direct, indirect, or cumulative effect on pallid bat.

Alternative 2

Direct Effects and Indirect Effects

Indicator 1) Disturbance at roost sites – Noise generated during project implementation could disturb the bats and cause temporary abandonment of the area. Bats roosting in the area may be displaced during harvest activities, which may have bioenergetic impacts if the bats were hibernating at the time of the disturbance. Bioenergetic impacts occur when fat stores needed for hibernation are used up before the bat is able to replace them, thereby causing extreme physical stress or mortality. Alternative 2 will treat *4,235* acres and all treatments could disturb roosting bats.

Indicator 2) Removal of roost structures – By harvesting dead or dying trees within the severely burned forested areas there is the possibility that pallid bat roost structures may be removed on 1,798 acres. The potential for direct mortality exists if this were to occur. Bats may be displaced during harvest activities, which may have bioenergetic impacts if the bats were hibernating at the time the trees were cut.

Whether or not the area is used by pallid bats is unknown. Surveys for bats are not always useful for detecting roosts because if bats are caught using mist nests or detected using echolocation detectors, they are out of the roost and foraging so only presence/absence data is actually acquired. In addition, roost site selection can vary from day to day and week to week when the bats are not hibernating. Protection of caves, bridges, mines, and other more permanent structures may provide the most long term benefit to bats that use cavities and crevices for roosting and hibernacula. Though they are widespread, trees are inherently transient as roost structures.

In addition to the area burned by the fire that will not be harvested all the proposed action alternatives have some level of snag retention and they all have the same parameters described for how those snags would be selected. The largest snags available, all pre-existing snags, and snags within wildlife leave clumps would be retained in all alternatives. This would help to alleviate some of the impacts to bats from snag removal by keeping the snags that would most likely last the longest and have the most potential to offer cavities. Also, the pre-existing snags may be selected by bats for roosting over recently burned trees, as hollows and cavities may already be present in the snag and it could have been a roost site before the wildfire occurred.

Recent post-fire studies indicate burned areas often attract large insect populations that provide locally increased foraging opportunities for several species of bats (Brown 2009). Salvage logging reduces habitat that supports insect populations but may improve foraging by reducing "clutter" that affects echolocation of prey by bats (Brown 2009). Bats forage in burned areas bordered by live trees, similar to the northern part of the Little Deer Project area, most extensively (Adams/Craven 2012).

Direct mortality could result from the felling of snags actively being used as roosts. Indirect effects may result from the removal of dead and dying trees and the potential roost habitat that these represent. Project design features in the proposed action include the retention of a minimum of 4-10 snags per acre ≥10" DBH, up to 1,000 snags greater than 28" within the tree removal units and retention of all incense cedar snags greater than 16" dbh, which would retain some essential habitat elements but not protect all possible roosting bats. Given that these bats are sensitive to disturbance, the proposed project could affect individuals. Due to the fire, there has been an increase in potential bat habitat within the watershed with the creation of abundant snags which could potentially offer roosting habitat in areas where no tree removal is proposed.

The proposed action will remove dead or dying trees on approximately 33 % of the area burned with high and moderate severity with the Little Deer wildfire. The remaining 67% will continue to offer roosting habitat for pallid bats that may exist in the project area.

Alternative 3

Direct and Indirect Effects

Indicator 2) Disturbance: The effects of Alternative 3 to pallid bats are similar to Alternative 2 with the primary difference between Alternative 2 and 3 pertinent to pallid bats are the acres proposed for treatment, and therefore disturbance or loss of roost structures. Alternative 3 would treat fewer acres than Alternative 2. Disturbance would occur on 3,808acres. .

Cumulative Effects

Cumulative effects from the proposed action alternatives are analyzed together because the issues described above for pallid bats are similar in nature and degree of impact between alternatives in terms of effects to pallid bats. Spatial bounding for this cumulative effects analysis is the 5th field watershed in order to capture the suitable habitat available to pallid bats in the area, and to encompass habitat types other than post fire snag habitat, that the bats may use. Temporal bounding for this analysis is defined by both those actions in the reasonably foreseeable future and the total time of implementation because impacts to this species center on disturbance, either by removal of roost trees or possible displacement of roosting bats. This bounding was considered appropriate in order to address whether other projects planned in the reasonably foreseeable future that could potentially impact pallid bat habitat and/or disturb roosting bats would overlap in space and time with the Little Deer Restoration Project.

Other habitat for pallid bats in the watershed includes all of the area within the Little Deer fire that are not planned for tree removal and any caves or rock crevices outside of treatment units as well as areas within the project area where green trees remain and the remaining watershed. There are no known roost structures within the analysis area. The untreated areas within proposed project area would not receive any additional treatment in the foreseeable future that would have additive impacts to pallid bats, either by removal of snags or with noise disturbance above ambient levels. These activities may disturb or temporarily displace pallid bats, but would not impact any cave or cave like structures.

It is my determination the proposed actions *may impact individual pallid bats but will not lead to a trend to federal listing or a loss of viability.*

Townsend's Big-Eared Bats

In California, the species is typically found in low desert to mid-elevation montane habitats, although sightings have been reported up to 10,800 feet (Philpott 1997, Sherwin 1998). Habitat associations include: desert, native prairies, coniferous forests, mid-elevation mixed conifer, mixed hardwood-conifer forests, riparian communities, active agricultural areas and coastal habitat types (Kunz and Martin 1982, Brown 1996, Sherwin 1998).

Distribution of this species is strongly correlated with the availability of caves abandoned buildings or abandoned mines for roost sites during all seasons and stages of their life cycle (Fellers and Pierson 2002, Sherwin 2000). Townsend's are a year-round California resident. Individuals are very loyal to their natal sites, and usually do not move more than 10 kilometers

from a roost site (Pierson et al. 1991, Pierson 1996). Roosts are found within caves, abandoned mines, and buildings. Buildings must offer cave-like spaces with a cool and moist microclimate in order to be suitable. Rock crevices and large snags may also provide habitat for roosting (Howell et. al. 1996). Night roosts may occur in more open settings, including under bridges (Philpott 1997). Foraging associations include edge habitats along streams and areas adjacent to and within a variety of wooded habitats (Sherwin 1998).Roosting sites are the most important limiting resource (CDFR 2008).

There are known occurrences of Townsend's big-eared bats on the Forest, including maternity and hibernacula sites in some caves on the Goosenest Ranger District and in other caves in the area north of Mount Shasta, about 8 mile south of the Little Deer Project. There are no known locations of Townsend's big-eared bats within the perimeter of the fire. There are no known caves in or adjacent to the project area, but one known roost site is located about 8 miles from the project and it is possible these bats forage in the project area.

While there are no mines, caves, or human made structures present within or adjacent to the proposed project area, the presence of numerous dead and dying trees and rock crevices, could potentially provide roosting structures. There have been no surveys for the Townsend's big-eared bat within or adjacent to the project area. There are no sightings and no known roosts within or adjacent to the project area or on the Goosenest Ranger District. It is unknown if caves exist on Private Lands within the project boundary. Up to 1,000 of the largest snags (>28" dbh) will not be harvested to provide roosting structure for this species, if present. Foraging associations include edge habitats along streams and areas adjacent to and within a variety of wooded habitats (Sherwin 1998). In California, the species is shown to forage preferentially in association with native vegetation (Brown 1996). Post-fire studies indicate burned areas often attract large insect populations that provide locally increased foraging opportunities (Brown 2009). Salvage logging reduces habitat that supports insect populations but may improve foraging by reducing "clutter" that affects echolocation of prey by bats (Brown 2009). Bats forage in burned areas bordered by live trees, (similar to that in the northern part of the Little Deer Project area, most extensively (Adams/Craven 2012). But, the full impact of salvage logging on the population distribution and roosting habitat of bats in areas that were salvage logged is needed (Brown 2009).

Proposed activities would be occurring near suitable Townsend's big-eared bat habitat and the species may be present, though there are no known roosts or sightings in the area. Therefore, noise disturbance may impact bats, if present.

Based on the discussion above, the pertinent indicator to the analysis of effects to Townsend's big-eared bats from the proposed activities is disturbance at roost sites.

Alternative 1

Direct and Indirect Effects

Indicator 1) Disturbance at roost sites – There would be no effects from this alternative because no activities would take place, thus no disturbance.

Cumulative Effects

Because there are no direct or indirect effects expected from the proposed alternatives, there are no cumulative effects expected.

It is my determination that Alternative 1 will have no direct, indirect, or cumulative effect on Townsend's big-eared bat.

Alternative 2 and 3

Direct and Indirect Effects

Indicator 1) Disturbance at roost sites – Noise generated during project implementation could disturb the bats and cause temporary abandonment of the area. Bats roosting in the area may be displaced during harvest activities, which may have bioenergetic impacts if the bats were hibernating at the time of the disturbance. Bioenergetic impacts occur when fat stores needed for hibernation are used up before the bat is able to replace them, thereby causing extreme physical stress or mortality.

Spatial bounding for this cumulative effects analysis is the 5th field watershed in order to capture the suitable habitat available to Townsend's big-eared bats in the area, and to encompass habitat types other than post fire snag habitat, that the bats may use. Temporal bounding for this analysis is defined by both those actions in the reasonably foreseeable future and the total time of implementation because impacts to this species center on disturbance, by possible displacement of roosting bats. This bounding was considered appropriate in order to address whether other projects planned in the reasonably foreseeable future that could potentially impact Townsend's big-eared bat habitat and/or disturb roosting bats would overlap in space and time with the Little Deer Restoration Project.

Other habitat for Townsend's big eared bats in the watershed includes the acres within the Little Deer fire that are not planned for tree removal and any caves or rock crevices associated with the peak of Little Deer as well as areas within the project area where green trees remain. There are no known roost structures within the analysis area. The untreated areas within proposed project area would not receive any additional treatment in the foreseeable future that would have additive impacts to bats, either by removal of snags or with noise disturbance above ambient levels. These activities may disturb or temporarily displace Townsend's big-eared bats, but would not impact any cave or cave like structures.

Cumulative Effects

Cumulative effects to fringed myotis are similar to those to Townsend's big-eared bats, discussed above, because the issues described above for Pallid bats are similar in nature and degree of impact between alternatives in terms of effects to *Townsend's big-eared bats.*

It is my determination the proposed actions *may impact individual Townsend's big-eared bats but will not lead to a trend to federal listing or a loss of viability*.

Fringed Myotis

The fringed myotis is listed by the USFWS as a "Federal Special Concern Species." It is found in western North America from south-central British Columbia to central Mexico and to the western Great Plains (Natureserve 2012). In California, it is distributed statewide except the Central Valley and the Colorado and Mojave Deserts (CWHR 2008). In California, this species is found from 1300 to 2200 meters in elevation in pinyon-juniper, valley foothill hardwood and hardwood-conifers (CWHR 2008).

There is little information on population size, abundance, and trends. Keinath (2004) suggests this is a widespread, but locally rare species; however, there are locales where it is abundant. Like other bat species, it appears there have been declines in numbers and colonies (Keinath 2004, USFS 2005).

The fringed myotis roosts in crevices found in rocks, cliffs, buildings, underground mines, bridges, and in large, decadent trees (Weller 2005). In general, this species is found in open habitats that have nearby dry forests and an open water source (Keinath 2004). The fringed myotis is sensitive to disturbance at roost sites, and the effects can be more adverse during hibernation and in maternity colonies (Keinath 2005). This can be either directly at or nearby these sites or alteration of the adjacent locale. Disturbance may lead to site abandonment, and during critical periods is expensive metabolically. Habitat alteration threatens this species because it dependent on older forest types. The fringed myotis depends on abundant large diameter snags and trees with thick loose bark. Thus, harvesting old growth and removal of snags for safety or fuel reduction reasons may reduce available roost sites (Keinath 2005)

There is increased likelihood of occurrence of this species as snags greater than 30 cm in diameter increases and percent canopy cover decreases (Keinath 2005). Large snags and low canopy cover forest habitat types, offer warm roost sites (Keinath 2005).

Home range size varies with insect abundance, increasing as the number of available insects increase. Keinath (2005) reports home range averages about 100 acres. Travel distances from roosting to foraging areas are up to eight kilometers (Keinath 2005). The fringed myotis consumes primarily beetles, and is supplemented by moths and fly larvae (Keinath 2005) captured in the air and gleaned from foliage (CWHR 2008).

While there are no mines, caves, or human made structures, suitable large rock outcroppings are present within or adjacent to the proposed project area and the presence of numerous dead and dying trees and rock crevices, could potentially provide roosting structures. There have been no surveys for the fringed myotis within or adjacent to the project area. There are no sightings and no known roosts within or adjacent to the project area or on the Goosenest Ranger District. It is unknown if caves exist on Private Lands within the project boundary. Up to 1,000 of the largest snags (>28" dbh) within treatment units will not be harvested.

Proposed activities would be occurring in suitable fringed myotis habitat and the species may be present, though there are no known roosts or sightings in the area.

Based on the discussion above, the pertinent indicator to the analysis of effects to fringed myotis from the proposed activities are 1) disturbance at roost sites.

Alternative 1

Direct and Indirect Effects

Indicator 1) Disturbance at roost sites – There would be no effects from this alternative because no activities would take place, thus no disturbance.

Cumulative Effects

Because there are no direct or indirect effects expected from the proposed alternatives, there are no cumulative effects expected.

It is my determination that Alternative 1 will have no direct, indirect, or cumulative effect on fringed myotis.

Alternatives 2 and 3

Direct and Indirect Effects

Indicator 1) Disturbance at roost sites – Noise generated during project implementation could disturb the bats and cause temporary abandonment of the area. Bats roosting in the area may be displaced during harvest activities, which may have bioenergetic impacts if the bats were hibernating at the time of the disturbance. Bioenergetic impacts occur when fat stores needed for hibernation are used up before the bat is able to replace them, thereby causing extreme physical stress or mortality.

Cumulative Effects

Cumulative effects to fringed myotis are similar to those to Pallid bats, discussed above, because the issues described above for Pallid bats are similar in nature and degree of impact between alternatives in terms of effects to *fringed myotis.*

It is my determination the proposed actions *may impact individual fringed myotis but will not lead to a trend to federal listing or a loss of viability*.

Western Bumblebee

Western bumblebee was added to the R5 Forest Sensitive species list due recent concerns regarding severe declines in distribution and abundance caused by a variety of factors including: diseases, loss of habitat, and loss of genetic diversity (Tommasi et al. 2004, Cameron et al. 2011, and Koch et al. 2012).

The bumblebee currently occurs in California and all adjacent states. Historically, the species was broadly distributed across western North America along the Pacific Coast and northwest to Alaska from the Colorado Rocky Mountains (Thorp and Shepard 2005, Koch et al. 2012). This species of bumblebee was one of the most broadly distributed bumblebee species in North America (Cameron et al. 2011).

Although the general distribution trend is steeply downward, especially in the west coast states, some isolated populations in Oregon and the Rocky Mountains appear stable (Rao et al. 2011, Koch et al. 2012). The overall status of populations in the west is largely dependent on geographic region: populations west of the Cascade and Sierra Nevada mountains are experiencing dire circumstances with steeply declining numbers, while those to the east of this dividing line are more secure with relatively unchanged population sizes. The reasons for these differences are not known.

Goosenest Ranger District is located in northeastern Siskiyou County, CA, at the southern extent of the Cascade Mountains and lies to the east of the Cascade crest which may contain more stable bee populations.

The historic presence of western bumblebees on the Forest was established by fifteen specimens collected prior to the year 2000; none of these collections were specifically noted to have occurred on the Goosenest Ranger District. There are no recorded collections of western bumblebee on the Forest since 2000. Although project-specific surveys have not been completed,

based on historic records, project area location on east side of Cascades, and available nesting and foraging habitat western bumblebee is assumed to be present on the Goosenest Ranger District. This analysis is based on the assumption that western bumblebees are using suitable habitat within the Project area.

Western bumblebees use areas with abundant flowering plants for foraging, abandoned rodent burrows for nesting, and downed woody debris for overwinter denning. Floral resources should be available from spring through autumn, not too fragmented or isolated in distribution to fully support the presence of viable bumblebee colonies (Evans et al. 2008). Open meadows and aspen communities, and downed woody debris are considered bumblebee habitat providing nesting and denning opportunities.

Western bumblebees have a short proboscis or tongue length relative to other co-occurring bumblebee species, which restricts nectar gathering to flowers with short corolla lengths and limits the variety of flower species it is able to exploit. Western bumblebees have been observed taking nectar from a variety of flowering plants (Evans et al. 2008). Flowers are widespread across the landscape of the Goosenest Ranger District; a district plant inventory lists hundreds of plants, many of which meet the foraging requirements of western bumblebees.

Rodents such as voles, chipmunks, and mice commonly occur on Goosenest Ranger District. Rodent burrows that provide nesting habitat and hibernation sites for queens are often concentrated in openings in the forest canopy and meadows.

The Little Deer wildfire burned a majority (82%) of the project area at a moderate to high severity. Flowering plants for foraging and downed woody debris used by bumblebees for winter dens were largely consumed by the fire; bees sheltering in burrows most likely were destroyed (Cane 2011). Although rodent burrows may remain, foraging habitat currently does not exist within the project area but unburned adjacent land still provides bumblebee habitat.

There are no known meadows within the project treatment area and aspen is limited to 3 very small (<3 acres) groves surrounded and limited by lava rock. Flowering plants could be expected to return in a very short time (about a year).

Based on the discussion above, the pertinent indicators to the analysis of effects to western bumblebee from the proposed activities are 1) acres of meadows or large opening that produce abundant flowering plants or aspen stands disturbed.

Alternative 1

Direct and Indirect Effects

Indicator 1) Disturbance of meadows or openings – There would be no effects from this alternative because no activities would take place, thus no disturbance.

Cumulative Effects

Because there are no direct or indirect effects expected from the proposed alternatives, there are no cumulative effects expected.

It is my determination that Alternative 1 will have no direct, indirect, or cumulative effects on western bumblebee.

Alternatives 2 and 3

Direct and Indirect Effects

The effects of Alternatives 2 and 3 to western bumblebees differ only by the number of acres disturbed by treatment. Flowering plants could begin to return to burned areas and provide forage as early as next year. Dead tree harvest is expected to be completed within one year (during 2015) but may require two years. Dead tree harvest activities could set back or interrupt the return of flowering plants until project completion. Reforestation will likely have a lesser impact to flowering plants because planting will be done by hand. It's expected that the flowering plants would continue to return and provide increased forage as the burned area heals from the fire.

Cumulative Effects

The effects of wildfire and proposed alternatives within the Project analysis area for western bumblebee are accounted for within the Existing Condition. There are no current or future foreseeable federal actions within the Project analysis area for bumblebees that would contribute to effects of the action alternatives. Current or reasonably foreseeable private actions, such as timber harvest on private timber lands, within or adjacent to the Project area may benefit bumblebees.

It is my determination the Little Deer Project will have "no effect" to western bumblebees.

Summary of Effects

Table WR-1 – Effects Determinations

Species	Determination
Northern spotted owl (NSO)	*No Effect*
NSO Critical Habitat	*No Effect*
Vernal pool fairy shrimp	*No Effect*
Gray wolf	*No Effect*
Bald eagle	*No Effect*
Northern goshawk	*May affect individuals but not likely to lead to a trend to federal listing or a loss of species viability*
Pallid bat	*May impact individuals but not likely to lead to a trend to federal listing or a loss of species viability.*
Townsend's big-eared bat	*May impact individuals but not likely to lead to a trend to federal listing or a loss of species viability.*
Fringed myotis	*May impact individuals but not likely to lead to a trend to federal listing or a loss of species viability.*
Greater sandhill crane	*No Effect*
Pacific fisher	*No Effect*
American marten	*No Effect*

Species	Determination
California wolverine	*No Effect*
Willow flycatcher	*No Effect*
Great gray owl	*No Effect*
Northwestern pond turtle	*No Effect*
Foothill yellow-legged frog	*No Effect*
Cascade frog	*No Effect*
Southern torrent salamander	*No Effect*
Blue-gray taildropper	*No Effect*
Western bumblebee	*No Effect*

Migratory Birds

On December 12, 2008, a Memorandum of Understanding was signed by the U.S. Department of Agriculture Forest Service (USFS) and the U.S. Fish and Wildlife Service (FWS) to promote the conservation of migratory birds (MOU). Section D, 3 of the MOU says, "Within the NEPA process, evaluate the effects of agency action on migratory birds, focusing first on species of management concern along with their priority habitats and key risk factors." For the Klamath National Forest, the migratory bird species of management concern are those bird species listed under the Endangered Species Act as Threatened (T) or Endangered (E), those species designated by the Regional Forester as Sensitive Species (S) and those species listed under Standard and Guideline 8-21 through 8-34 of the Forest Plan as Management Indicator Species (MIS) for project level assessment. The species are listed below in Table WR-2 by common name, scientific name, and the category in which they belong.

Table WR-2 - Klamath National Forest migratory bird species of management concern

Common Name	Scientific Name	Category
Northern spotted owl	*Strix occidentalis*	T
Marbled murrelet	*Brachyramphus marmoratus*	T
Bald Eagle	*Haliaeetus leucocephalus*	S
Northern goshawk	*Accipiter gentilis*	S
Willow flycatcher	*Empidonax trailii*	S
Greater sandhill crane	*Grus canadensis tabida*	S
Downy woodpecker	*Picoides pubescens*	Snag MIS
Red breasted sapsucker	*Sphyrapicus ruber*	Snag MIS
Hairy woodpecker	*Picoides villosus*	Snag MIS
Black backed woodpecker	*Picoides arcticus*	Snag MIS
White-headed woodpecker	*Picoides albolarvatus*	Snags and mature pine MIS
Pileated woodpecker	*Dryocopus Pileatus*	Snag MIS
Vaux's swift	*Chaetura vuaxi*	Snag MIS

Common Name	Scientific Name	Category
Flammulated owl	*Otus flammeolus*	Mature pine MIS
Pinyon jay	*Gymnorhinus cyanocephalius*	Mature pine MIS
Brown Creeper	*Certhia americana*	Mature pine MIS
Pygmy nuthatch	*Sitta pusilla*	Mature pine MIS
Acorn woodpecker	*Melanerpes formicivorus*	Hardwoods MIS
American dipper	*Cynclus platensis*	River/Stream MIS
Swainson's hawk	*Buteo swainson*	Grassland/Shrub-steppe MIS
Sage thrasher	*Oreoscoptes montanus*	Grassland/Shrub-steppe MIS
Loggerhead shrike	*Lanius Ludovicianus*	Grassland/Shrub-steppe MIS
Burrowing owl	*Athene cunicularia*	Grassland/Shrub-steppe MIS

The MOU expands on the guidance for the NEPA process in Section D3 of the MOU to say, "to the extent practicable:

A. Evaluate and balance long-term benefits of projects against any short- or long term adverse effects when analyzing, disclosing, and mitigating the effects of actions.
B. Pursue opportunities to restore or enhance the composition, structure, and juxtaposition of migratory bird habitats in the project area.
C. Consider approaches, to the extent practicable, for identifying and minimizing take that is incidental to otherwise lawful activities, including such approaches as:
    i. altering the season of activities to minimize disturbances during the breeding season;
    ii. retaining snags for nesting structures where snags are underrepresented;
    iii. retaining the integrity of breeding sites, especially those with long histories of use and;
    iv. giving due consideration to key wintering areas, migration routes, and stopovers; and
    v. minimizing or preventing the pollution or detrimental alteration of the environments utilized by migratory birds whenever practical by assessing information on environmental contaminants and other stressors relevant to migratory bird conservation.
D. Coordinate with the appropriate FWS Ecological Services office when planning projects that are likely to have a negative effect on migratory bird populations. Cooperate in developing approaches to minimize negative impacts and maximize benefits to migratory birds."

Per MOU item D3a. The MOU recognizes that, "Within the National Forest System, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales..." At the Forest scale, the land allocations in the Klamath FOREST PLAN are designed to maintain a variety of habitat types, which would provide habitat for migratory birds that may use the project area at some point during the year. "Land allocations and management direction are designed to maintain species, community and genetic diversity. Diversity will be

provided through a mixture of vegetative types and seral stages" (KFOREST PLAN Record of Decision). The FOREST PLAN has provisions that provide for biological diversity on the Forest (EIS pages 4-38 through 4-91) including designations for Wilderness, Research Natural Areas, the Butte Valley National Grassland, Special Habitats (includes Late Successional Reserves, Bald Eagle Management Areas, and Peregrine Falcon Management Areas), a Managed Wildlife Area, Goshawk Management Areas, and Riparian Reserves. The designations and standards and guidelines for Late Successional Reserve and Riparian Reserve land allocations are designed to ensure the viability of species that use late-seral and aquatic habitats. A General Forest land allocation is intended to provide for early and mid seral habitats which are also needed by some migratory bird species. At the project level, the KFOREST PLAN identified standards and guidelines to address the diversity of major biological communities and priority habitat (such as snags and riparian vegetation) found on the Forest and identified guidance for assessing impacts to priority habitat for MIS.

The Klamath National Forest is proposing to manage lands on the Goosenest Ranger District and located in the Butte Creek and Parks Creek-Shasta River 5th field watersheds. Proposed management is intended to implement direction contained within the Klamath National Forest Land and Resource Management Plan (FOREST PLAN, USFS 1995). Opportunities to promote conservation of migratory birds and their habitats in the project area were considered during development and design of the Little Deer project.

For the Little Deer Project, the long-term benefit to those species that are associated with forested conditions (and their key habitats) is an accelerated rate of recovery of the coniferous overstory that was removed with the high intensity Little Deer fire in 2014. Key habitat components that were present before the fire are no longer present in the area, as most of the fire (82%) burned with high and moderate intensity which resulted in a very high rate of mortality of both the understory and overstory. These habitat components would eventually return without treatment, but at a much slower rate of return. The proposed reforestation of 3,370 acres of intensely burned forest would help to accelerate this return.

Those species associated with a brush understory would have access to this habitat type as the seral stages of development within the project area progress. In addition, species that utilize bitterbrush and/or mountain mahogany would benefit from the proposed planting of these species throughout the project area. Likely impacts to habitats and select migratory bird populations resulting from the Little Deer project have been assessed in detail within the project Management Indicator Species (MIS) Reports Part I and II, and impacts to federally listed and Forest Service Sensitive birds and their habitats have been analyzed in the project resource report.

Because the area consists of moderate and high severity burned mixed conifer forest, the bird species most likely to incur short- and/or long-term effects would be snag associated species, particularly post fire dependent habitat specialists. While many of these species are not considered migratory, there are some migratory secondary cavity nesters that rely on cavities excavated by primary cavity nesters.

There are 5,503 acres of available habitat for post fire dependent snag associated species, defined for the purposes of this analysis as coniferous forest burned within 5 years of the current proposed project, with high to moderate intensity, within the Butte Creek and Parks Creek-Shasta River 5th field watersheds. The treatments proposed for the Little Deer project would

affect 3,370 acres, with dead tree removal occurring on 1,821 acres in Alternative 1 and 1,558 acres in Alternative 2 or about 61% of the total available habitat created by the Little Deer fire.

While both Action Alternatives have tree removal proposed, the difference between these alternatives that is pertinent to this analysis is the number of acres of snags to be harvested and the acres remaining post-harvest as snag habitat.retained within tree removal units. The manner in which the snags are retained will be the same across all action alternatives (i.e. retained in clumps, some may be situated around live trees where possible, retention of all pre-existing snags, up to 1,000 snags >28" within the treatment area and all incense cedar snags >16" dbh). For a more complete discussion of snag associated habitat please see the complete MIS report in the Little Deer Project file.

Because the overall suitability of the habitat for post-fire snag associated species is directly related to the number of available snags in post-fire habitat, it would follow that the more snags retained, the more habitat is available. Salvage harvest has impacts on the suitability of post-fire habitat for snag associated species. Areas that are harvested may decrease in suitability for some species, but not for all. No unit will be left completely devoid of snags, and so should not be considered as habitat lost. Instead, the resulting stand may provide habitat for aerial foragers (such as downy woodpeckers) that require more open areas between snags, rather than wood/bark foragers (such as black-backed woodpeckers) that require more available foraging substrate i.e. snags or dying trees, which would be available in the remaining untreated portions of the project area.

The Forest has sustained over 200,000 acres of high to moderate severity wildfire during 2014 alone. For migratory bird species associated with post-fire snag habitat, abundant habitat is available throughout the Forest. Habitat modification from the proposed Little Deer project would not cause a measurable negative impact to migratory bird populations due to the small amount of acreage where project activities would occur in relation to the overall available habitat on the Forest. In addition, two of the three action alternatives have project implementation timeframes during the late summer-winter months when migratory birds are not present in the area.

In balance, the long-term benefits are of greater conservation value to the species than the short- and long-term adverse effects.

Per MOU item D3b. The Purpose and Need for the Little Deer Restoration Project is not to restore or enhance the composition, structure, and juxtaposition of migratory bird habitats in the project area. Although not a purpose and need for this action, there are benefits to the migratory bird species of management concern as described under item 3a.

Per MOU item D3c. The project does not result in "take; "take" is defined in 50 CFR § 10.12 and means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.

Per MOU item D3d. The Little Deer Restoration project is not likely to have a negative effect on migratory bird populations as summarized in this report and further described in the Little Deer Restoration Project BE, BA and MIS reports.

Survey and Manage Species

Two species of terrestrial mollusk, the blue-gray taildropper (Prophysaon coeruleum) and the Siskiyou sideband (Monadenia chaceana), listed as Survey and Manage Species were analyzed to assess whether negative impacts would result from the proposed project. It was determined that no habitat currently exists in the project area for either species.

Monadenia chaceana may be found within approximately 100 feet of rocky areas, talus deposits and in associated riparian areas in the Klamath province and adjacent portions of the south-western Oregon Cascades. Areas of herbaceous vegetation in these rocky landscapes adjacent to forested habitats are preferred. Areas that contain moist, shaded rock surfaces are preferred for daily refuges. Forest habitats without either rock features or large woody debris are not currently considered to be suitable habitat for this species (Duncan et al 2003).

Prophysaon coeruleum is found in moist conifer and mixed conifer/hardwood forests usually located in sites with relatively higher shade and moisture levels than those of the general forest habitat. It is usually associated with partially decayed logs, leaf and needle litter (especially hardwood leaf litter), mosses and moist or riparian plant communities such as big leaf maple and sword fern associations (Duncan et al. 2003).

Both of these species are associated with either a permanent source of water or riparian vegetation, neither of which occurs within the project area. Water availability is very limited within the project area. There are no intermittent or perennial streams or water bodies within the project area and no riparian vegetation. The project hydrologist report indicates that there is little to no surface hydrologic connectivity between project units and any riparian reserve or channel outside of the project area. In addition, there is not likely sufficient ambient moisture in project area habitats to support these species' respiration and egg production.

Currently, habitat for these species is not present in project area. Surveys were not triggered, nor were management of known sites for Survey & Manage Species, as described in the NEPA Species Tracking sheet (available in the project record).

Deer and Elk

The Forest Plan provides direction for big game habitat management in Chapter 4 for the maintenance or improvement of wildlife habitat for Forest Emphasis species such as elk and deer, specifically Standard and Guide 8-47 which directs the design of projects “to improve, create or maintain a mix of forage and cover conditions that will maintain or increase deer populations”

Direction for Management Area 16- Forage (MA-16) on pages 4-171 to 4-175 of the Forest Plan provides further direction for improvement of habitat for deer and pronghorn. The goal of MA-16 is a desired future condition of a patchy mosaic vegetation pattern suitable for big game cover, such as thermal and hiding cover, and forage. Browse species such as bitterbrush and mountain mahogany growing in varying age classes will provide high quality nutrition forage for big game. Specific Standards and Guides pertinent to Little Deer and this discussion include MA 16-13, and 18.

- MA 16 – 13 A wide range of vegetative treatments (which may include salvage, thinning, planting or crushing) may be designed and implemented to accomplish big game habitat goals and ecosystem health.

- MA 16 – 18 Reforestation efforts should be implemented in a manner to promote forage use and the development of optimum thermal cover.

Black-tailed deer and Roosevelt elk are Forest emphasis species for which Forest Plan standards and guidelines 8-47 through 8-55 are displayed on pages 4-33 of the Forest Plan. Deer require a vegetation mosaic of several components including shrubs and grasses. Grasses provide quality spring to early summer forage for deer and is an important component of suitable deer habitat (CDFG 2008). Grass is important in the spring when nutrients in grass are highest (Dietz 1976).

Ponderosa pine/bitterbrush vegetation type is one of the dominant plant associations on the Goosenest Ranger District at lower elevations. The Goosenest AMA Ecosystem Analysis (1996) identified the ponderosa pine/bitterbrush/mountain mahogany community as producing a relatively large amount of big game and domestic ungulate forage (USDA 1996). In general, bitterbrush occurrence is abundant in open ponderosa pine stands, but declines under closed canopies.

Antelope bitterbrush was the predominant browse species in the project area and burned with high intensity with the Little Deer fire in 2014, such that 82% of the total fire resulted in almost complete overstory and understory mortality. Varying age classes of bitterbrush occurred in the project area prior to the Little Deer fire, from mature and decadent (older, less vigorous) to younger sprouts. Bitterbrush is not a fire tolerant brush species, so that this type of high severity fire kills the existing bitterbrush component in the forest understory and openings.

Forage and cover are important attributes of quality deer and elk habitat, and both were removed with the Little Deer fire. Individual deer or elk may have used the area prior to the fire, but with the key habitat elements such as cover and palatable forage reduced or eliminated by the wildfire, the area is now marginal habitat at best. If deer or elk are present, they may use the areas along the periphery that still contain some vegetation cover.

Bitterbrush generally sprouts from seeds and can take well over 10 years to recovery in areas where fire has killed the existing seed source (Clark 1982). However, seeds are more likely to germinate after fires with higher fuels consumption, and mortality of mature plants, compared with fires that did not remove duff and litter (Driver 1983) (Tiedemann and Johnson 1983). In areas where a seed source is limited, browse and grass planting would help to alleviate the impacts of the wildfire by decreasing the time of recovery and increasing the availability of cover.

Therefore the indicator for the analysis of the effects of the proposed alternatives is recovery of understory browse and cover species.

Alternative 1

Direct Effects and Indirect Effects

Because the seed source is limited in much of the project area, browse planting would help to alleviate the impacts of the wildfire by decreasing the time of recovery and increasing the availability of cover. If these actions did not take place the understory and browse would eventually recover, though at a much slower rate. This rate would be very difficult to quantify because the quantity and quality of the existing seed source and the degree to which it survived the intense wildfire is unknown. Impacts to deer and elk in the project area of not conducting the

proposed activities are therefore also unknown, but it is possible that a slower recovery rate of browse would influence the use pattern of the area caused by the lack of available forage. Because the area would also not receive tree removal treatments, there may be limited amounts of available cover; however the importance of cover is strongly influenced by the availability and proximity of forage, so that cover without available forage would not be useful for deer or elk in the area. Therefore, the no action alternative would contribute the least to the recovery of understory browse and cover species for deer and elk.

Cumulative Effects

Because there are no direct or indirect effects expected from the proposed alternatives, there are no cumulative effects expected.

It is my determination that Alternative 1 will not promote the desired conditions for deer and elk browse or thermal cover in the short-term (<10years). In the long-term (≥10 years), deer and elk habitat will develop slowly and will provide some browse and thermal cover.

Alternatives 2 and 3

Direct Effects and Indirect Effects

All proposed action alternatives would seed grasses (see Range Resource Report in Project Record) and plant various species of browse, such as bitterbrush and mountain mahogany, as seedlings in order to increase the survival rates and the rate of recovery of the forage. Alternative 2 proposes planting on 1,474 acres. Seedlings would be planted in areas that would offer the most benefit to deer/elk due to the juxtaposition of cover to forage and in a mosaic pattern that would not create a continuous fuel pattern that would increase the chances for future wildfires. Each planting or seeding area will range in size from ¼ acre to 2 acres, focusing in areas where brush species previously occupied the majority of the stand type prior to the fire. Planting would occur within Forage and General Forest Management Areas.

Both action alternatives propose planting of browse and grass species, but fewer acres would be planted in Alternative 2. In areas where browse is limited, planting would result in more available browse and cover, and higher recovery rate of the forage. Therefore, alternatives that plant a higher number of acres would provide the most benefit for species such as deer and elk, as well as multiple other game and non-game species that utilize bitterbrush and mountain mahogany (i.e. birds, rodents and rabbits that feed on the seeds and succulent twigs).

Both action alternatives will meet the purpose and need of the project, in terms of recovery of the understory. Alternative 3 would benefit deer and elk slightly more than Alternative 2. For more details as to the differences between the action alternatives, see Chapter 2 of the EA.

Cumulative Effects

Cumulative effects under NEPA are those effects on the environment that result in incremental effects of the proposed action when added to the effects of other past, present, and reasonably foreseeable future actions on federal, state, tribal, local, or private lands. Past actions and events, most recently and most notably the 2014 Little Deer fire, form the baseline for current habitat conditions in the analysis area. While suitable deer and elk habitat existed in the project area before the fire, it was burned with high and moderate severity throughout the majority of project area. There are no future foreseeable actions in the project area other than the proposed actions

that would have impacts that would be either measurable or distinguishable from the impacts of the Little Deer fire on deer or elk that may occur in the area.

It is my determination that Alternative 2 and 3 will promote the desired conditions for deer and elk browse or thermal cover in the short-term (<10 years) with the proposed planting of browse plant species and tree seedlings that will provide thermal cover. In the long-term (≥10 years), deer and elk habitat will continue to develop and provide needed browse and thermal cover.

Compliance with law, regulation, policy, and the Forest Plan

This BE/BA/Wildlife Resource Report provides biological information to ensure USDA Forest Service and the Klamath National Forest compliance with the National Forest Management Act (NFMA), National Environmental Policy Act (NEPA), Forest Service Manual 2670, Section 7 of the Endangered Species Act of 1973, as amended [16 U.S.C. 1536 (c) et seq. 50CFR 402], and follows the standards established in the Forest Service Manual direction (FSM 2672.42, USDA Forest Service 1991) and 1995 Forest Plan. This document complies with the requirements of the Endangered Species Act by disclosing effects on listed species and their habitats. Additionally, this document provides a standard process to provide full consideration of federally-listed and Forest Service Sensitive species and their habitats in the decision-making process, using the list provided by Region 5 (dated June 30, 2013) for Sensitive species.

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